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May 14, 1996

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Secretary,
Federal Communications Commission
Washington, DC 20559

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Regarding: ET Docket No. 95-18

I am John C. Bellamy, PhD a telecommunications consultant responding on behalf of Enron. I attended a meeting at COMSAT Corporation offices in Bethesda, Maryland on April 25, 1996 for discussions concerning the feasibility of the Proposed Sharing of 2 GHz frequencies allocated to Fixed Service (FS) channels with new Mobile Satellite Services (MSS). The following five comments reflect my observations and concerns regarding the feasibility of sharing the spectrum.

- 1) The amount of technical information regarding the proposed MSS system operation provided at the meeting was insufficient to come to any firm conclusions but, from what was presented, the major concern for FS incumbents would be direct co-channel interference from a MSS satellite into an FS receiver. Although most FS antennas have a somewhat horizontal orientation it is not uncommon for antennas at the end of a route to be situated in a valley and pointing to a nearby hill which produces sufficient elevation to point directly at a proposed satellite. In view of the fact that MSS ground receivers are mobile units they would necessarily need relatively large received power levels which would certainly be disruptive to the FS signals. Calculating the effects of a single satellite illuminating an FS receiver are straight forward and can be easily determined once the parameters of the MSS system are known.
- 2) The antenna patterns of the proposed MSS satellites was not disclosed but because satellite antennas typically have fairly significant sidelobes it is certainly possible that FS receivers with low elevation angles could experience detrimental interference from MSS satellites that are low on the horizon. Again, the calculations of this situation are straight forward when the MSS system parameters are known.
- 3) The VISUALYZE TM interference simulation/analysis program demonstrated at the meeting was seen to have an effective user interface but there was no disclosure of the fundamental equations and assumptions used in the analyses to determine its suitability for thoroughly analyzing MSS/FS interference levels. It appears as though the existing implementation may be suitable for analyzing MSS interference into digital FS receivers but there was definite indications that the MSS interference effects into analog receivers needed to be developed. Considering the relatively narrow band of MSS channels (25 kHz) the worst case interference effect of an MSS satellite into an FS receiver is likely to

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be noise in a 4 kHz baseband channel that has an rf frequency falling inside the 25 kHz interference.

4) A second aspect of relatively narrow band interference that needs to be determined, yet was not disclosed to have been included in the analyses, is the effect of the interference on the carrier recovery of a FS victim receiver. Narrow band interference that falls on or near the carrier of a relatively wideband signal can significantly disrupt the carrier recovery operations even though the total interference power may be sufficiently below the total victim power to otherwise be acceptable.

5) The VISUALYZE TM program relies on Monte Carlo simulations to analyze the effects of multiple moving satellites and dynamic fading conditions. While this type of program can produce useful results it requires very extensive processing time to be sure that worst case conditions occur in the course of the simulations. A generally superior approach to analyzing the problem is to directly analyze worst case conditions and then determine the probability of occurrence of the worst case conditions. This type of approach has long been accepted as an effective means of analyzing the effects of signal fading. It would seem that determining probability distributions for satellite positions would also be straight forward. A direct approach for interference analysis assures that worst case conditions are not overlooked and greatly reduces the processing time so that interference into large numbers of potential victims can be analyzed.

Respectfully Submitted,

A handwritten signature in cursive script, reading "John C. Bellamy".

John C. Bellamy